CLAIMS

1. A method for producing a transition between a first element having a first refractive index difference (Δn) percentage and a second element having a second Δn percentage higher than the Δn of said first element, comprising the steps of:

controlling the Δn along a length of electro-optic polymer to achieve a gradual transition from a low Δn to a high Δn along said length; and

optically coupling said length of electro-optic polymer between said first element and said second element.

2. The method of claim 1, wherein said controlling step comprises at least the step of:

performing selective deposition on a length of undoped substrate having plural doping regions, using increasing doping levels with each successive doping region.

3. The method of claim 2, wherein said selective deposition step is performed using a polymer dopant.

4. The method of claim 3, wherein said polymer dopant is deposited through photolithographic masking.

5. The method of claim 4, wherein said polymer dopant is deposited by spraying said polymer dopant through said photolithographic masking onto said substrate.

6. The method of claim 4, wherein said polymer dopant is deposited by dipping said photolithographically-masked substrate into said polymer dopant.

7. The method of claim 4, wherein said polymer dopant is deposited using vacuum pyrolisis.

8. The method of claim 1, wherein said controlling step comprises at least the step of:

performing diffusion doping on a length of undoped substrate having plural doping regions, increasing the diffusion time with each successive doping region.

9. The method of claim 8, wherein said step of performing diffusion doping comprises the steps of:

depositing a layer of an impurity source on said entire length of said substrate and leaving said layer on said substrate for a predetermined time period;

removing a portion of said layer covering a first of said plural doping regions and leaving the remainder of said layer on said substrate for a second predetermined time period;

repeating said removing step for each of said plural doping regions until all of said layer has been removed.

10. The method of claim 1, wherein said length of elector-optic polymer comprises a doped polymer core surrounded by doped and poled cladding, said doped and poled cladding comprising a layer of plural poling-electrodes and a common reference electrode layer, with said doped polymer core situated therebetween, said controlling step comprising at least the step of:

applying a first poling voltage of a first value to a first of said poling-electrodes;

applying sequentially increasing poling voltage values to each successive poling electrode.

11. The method of claim 1, wherein said controlling step comprises at least the step of:

sandwiching a tapered length of doped polymer between first and second continuous poling electrodes; and

applying a constant poling voltage across said first and second continuous poling electrodes for a predetermined time period.

12. A transition structure situatable between a first element having a first refractive index difference (Δn) percentage and a second element having a second Δn percentage higher than the Δn of said first element, said transition structure obtainable by the process steps of:

controlling the Δn along a length of electro-optic polymer to achieve a gradual transition from a low Δn to a high Δn along said length; and

optically coupling said length of electro-optic polymer between said first element and said second element.

13. The transition structure of claim 12, wherein said controlling step comprises at least the step of:

performing selective deposition on a length of undoped substrate having plural doping regions, using increasing doping levels with each successive doping region.

14. The transition structure of claim 13, wherein said selective deposition step is performed using a polymer dopant.

15. The transition structure of claim 14, wherein said polymer dopant is deposited through photolithographic masking.

16. The transition structure of claim 15, wherein said polymer dopant is deposited by spraying said polymer dopant through said photolithographic masking onto said substrate.

17. The transition structure of claim 15, wherein said polymer dopant is deposited by dipping said photolithographically-masked substrate into said polymer dopant.

18. The transition structure of claim 15, wherein said polymer dopant is deposited using vacuum pyrolisis.

19. The transition structure of claim 12, wherein said controlling step comprises at least the step of:

performing diffusion doping on a length of undoped substrate having plural doping regions, increasing the diffusion time with each successive doping region.

20. The transition structure of claim 19, wherein said step of performing diffusion doping comprises the steps of:

depositing a layer of an impurity source on said entire length of said substrate and leaving said layer on said substrate for a predetermined time period;

removing a portion of said layer covering a first of said plural doping regions and leaving the remainder of said layer on said substrate for a second predetermined time period;

repeating said removing step for each of said plural doping regions until all of said layer has been removed.

21. The transition structure of claim 12, wherein said length of elector-optic polymer comprises a doped polymer core surrounded by doped and poled cladding, said doped and poled cladding comprising a layer of plural poling-electrodes and a common reference electrode layer, with said doped polymer core situated therebetween, said controlling step comprising at least the step of:

applying a first poling voltage of a first value to a first of said poling-electrodes;

applying sequentially increasing poling voltage values to each successive poling electrode.

22. The transition structure of claim 12, wherein said controlling step comprises at least the step of:

sandwiching a tapered length of doped polymer between first and second continuous poling electrodes; and

applying a constant poling voltage across said first and second continuous poling electrodes for a predetermined time period.